

REMARKS

Claims 2-4, 7-9, 11-13, 16-18, 21-23, 25-29, 31-32, 38-40, 43-45, and 48-50 remain in the application. Claims 2, 7, 11, 16, 21, 27, 38, 43, and 48 have been amended hereby, and claims 1, 5-6, 10, 14-15, 19-20, 24, 30, 33-37, 41-42, 46-47, and 51 have been cancelled, without prejudice or disclaimer.

The claims have been carefully reviewed and amended with particular attention to the points raised in the Office Action. It is submitted that no new matter has been added and no new issues have been raised by the present amendment.

Reconsideration is respectfully requested of the objection to the drawings as allegedly lacking descriptive wording under 35 CFR 1.83(a). Descriptive wording has been added to identify element 15 of Fig. 2 and element 16 of Fig. 3 as required by the Office Action. Replacement sheets and annotated sheets showing changes are attached following page 31 of this paper.

Withdrawal of the objection to the disclosure is respectfully requested.

Reconsideration is respectfully requested of the objection to claims 6-14, 20-32, and 42-51. The instances noted in the Office Action have been corrected in the amendments made to the claims hereby.

Reconsideration is respectfully requested of the rejection of claims 1-2, 4, 6-7, 9, 11, 13, 15-16, 18, 20-21, 27, 29, 33, 35, 37-40, 42-45, and 47-50 under 35 U.S.C. § 103(a), as allegedly being unpatentable over U.S. Patent No. 5,903,614 (Suzuki et al.) in view of U.S. Patent No. 5,790,516

(Gudmundson et al.).

Applicant has carefully considered the comments of the Office Action and the cited references, and respectfully submits that claims 2, 4, 7, 9, 11, 13, 16, 18, 21, 27, 29, 38-40, 43-45, and 48-50 are patentably distinct over the cited references for at least the following reasons.

The present invention relates to a communication device and method for performing bidirectional communication between a communication terminal device and a base station device. One frame is prescribed for each predetermined time period and a plurality of time slots are formed in one frame. In each slot of an uplink period, communication of a down-link from the base station device to the communication terminal device is performed by using a multicarrier signal having data dispersed to  $m$  units of subcarriers for transmission, where  $m$  is an integer not smaller than 2. Communication of an up-link from the communication terminal device to the base station is performed by using a multicarrier signal having data dispersed to  $j$  units of subcarriers for transmission, where  $j$  is an integer smaller than  $m$ , or a multi-carrier signal having data dispersed to  $m$  units of subcarriers for transmission.

Suzuki et al., as understood by Applicant, relates to a reception method of a multicarrier system wherein phase-modulated data are transmitted by using each of a plurality of subcarriers. The method includes a random data generating step of generating randomly-changed phase shift data, a multiplying step for multiplying each of the received subcarriers with an output obtained in the random data

generating step, and a state detection signal generating step for monitoring a state of an output obtained in the multiplying step and for generating a predetermined state detection signal when a predetermined state is detected.

Gudmundson et al., as understood by Applicant, relates to a method and system for data transmission in a orthogonal frequency division multiplexed (OFDM) system. Each of a plurality of data symbols having a symbol period  $T$  are modulated onto one of a plurality of subcarriers including a first data signal. The first data signal is then multiplied by a pulse shaping function over the period  $T$  to generate a second data signal. The second data signal is then transmitted on a system carrier over a communications channel of the OFDM system.

The Office Action states that Suzuki et al. discloses "... an inherent timing control means (Figure 2; col. 3, lines 35-38) for the terminal devices to transmit on appropriate time slots within a frame" (see Office Action, p. 3, lns. 15-17). Applicant respectfully disagrees.

As understood by Applicant, in the section of Suzuki et al. cited in the Office Action, a mode of coupling to each portable station is disclosed (see Suzuki et al., col. 3, lns. 31-48; Figs. 2A-2G). Using the orthogonal bases formed by dividing the frequency axis and the time axis in a grid, the multiple access in which the cell station communicates simultaneously with a plurality of portable stations is performed (see id.).

Time slots of the portable stations are coupled to the

cell station through one band slot (see id.). The cell station establishes a frame timing of 24 time slot periods, as illustrated in Fig. 2A. Six portable stations may be coupled to one band slot, and timing and frequency hopping processes may be performed during a spare time remaining after reception and transmission during one time slot period is complete (see id., col. 4, lns. 5-21).

As understood by Applicant, Suzuki et al. discloses a plurality of band slots assigned to one base station (see id., col. 4, lns. 22-34). In a cellular system wherein one cell is comprised of one base station, a band of 1.2 MHz allocated to one cell may correspond to eight band slots being assigned to one cell (see id.). The frequency hopping process is performed to switch frequencies to allow equal use of the band slots (see id.).

In the presently claimed invention, when transmission of both a single-carrier signal and a multicarrier signal is possible at each slot, the state of the received signal is discriminated on the side of the base station device (see specification of the present application, p. 28, lns. 11-13).

The receiving processing system of the base station device includes a low-noise amplifier connected to a transmission/receiving antenna through an antenna switch 152, an orthogonal detector connected to the low-noise amplifier through a receiving mixer, a parallel-serial converter and a fast Fourier transform (FFT) circuit connected to the orthogonal detector through an A/D converter, a parallel/serial converter connected to the FFT circuit, and a

discrimination and selection circuit connected to the parallel/serial converters. (see id.).

It is respectfully submitted that neither Suzuki et al. nor Gudmundson et al., alone or in combination, disclose or suggest a communication system including a base station device having transmission means for carrying out communication of a down link to a communication terminal device by using a multicarrier signal having data dispersed to a plurality of subcarriers for transmission, and receiving means for receiving a multicarrier signal having data dispersed to the plurality of subcarriers or a single-carrier signal transmitted from the communication terminal device, wherein the base station device further includes discrimination means for discriminating the multicarrier signal using m units of subcarriers and the single-carrier signal, so that demodulation processing conforming to a received signal is carried out by the receiving means on the basis of a result of discrimination of the discrimination means, as recited in amended independent claim 2.

Accordingly, for at least the above-stated reasons, it is respectfully submitted that amended independent claim 2, and the claims depending therefrom, are patentable over the cited references. Amended independent claims 7, 11, 16, 21, 27, 38, 43, and 48, and the claims depending therefrom, are believed to be patentable over the cited references for at least similar reasons.

Reconsideration is respectfully requested of the rejection of claims 3, 5, 8, 10, 12, 14, 17, 19, 22, 23-24,

28, 30, 34, 36, 41, 46, and 51 under 35 U.S.C. § 103(a), as allegedly being unpatentable over Suzuki et al. in view of Gudmundson et al. and further in view of U.S. Patent No. 5,726,978 (Frodigh et al.).

Applicant has carefully considered the comments of the Office Action and the cited references, and respectfully submits that claims 3, 8, 12, 17, 22-23, and 28 are patentably distinct over the cited references for at least the following reasons.

Frodigh et al., as understood by Applicant, relates to a method and system for adaptive channel allocation in a frequency division multiplexed system is provided. A subset of M subcarriers is chosen from a larger set of N subcarriers available for communications on a link. As communication occurs on the link, signal quality measurements on the subcarriers of the subset of M subcarriers and interference measurements on the subcarriers of the group of N subcarriers are periodically performed. The signal quality and interference measurements are used to reconfigure the subset of M subcarriers to reduce co-channel interference on the link.

It is respectfully submitted, however, that Frodigh et al., alone or in combination with Suzuki et al. or Gudmundson et al., does not disclose or suggest a communication system including a base station device having transmission means for carrying out communication of a down link to a communication terminal device by using a multicarrier signal having data dispersed to a plurality of subcarriers for transmission, and

receiving means for receiving a multicarrier signal having data dispersed to the plurality of subcarriers or a single-carrier signal transmitted from the communication terminal device, wherein the base station device further includes discrimination means for discriminating the multi-carrier signal using  $m$  units of subcarriers and the single-carrier signal, so that demodulation processing conforming to a received signal is carried out by the receiving means on the basis of a result of discrimination of the discrimination means, as described above and as recited in amended independent claim 2.

Accordingly, for at least the above-stated reasons, it is respectfully submitted that amended independent claim 2, and the claims depending therefrom, are patentable over the cited references. Amended independent claims 7, 11, 16, 21, and 27, and the claims depending therefrom, are believed to be patentable over the cited references for at least similar reasons.

Reconsideration is respectfully requested of the rejection of claims 25-26 and 31-32 under 35 U.S.C. § 103(a), as allegedly being unpatentable over Suzuki et al. in view of Gudmundson et al. and Frodigh et al. and further in view of U.S. Patent No. 5,940,143 (Igarashi et al.).

Applicant has carefully considered the comments of the Office Action and the cited references, and respectfully submits that claims 25-26 and 31-32 are patentably distinct over the cited references for at least the following reasons.

Igarashi et al., as understood by Applicant, relates to

an automatic gain controlling circuit and a high-definition television signal receiving apparatus that includes an input terminal for receiving a signal including first and second signal components, a first automatic gain controlling amplifier for amplifying the received signal and providing an amplified output signal, a filter for selectively passing a signal portion in a predetermined band of the amplified output signal from the first automatic gain controlling amplifier, and a second automatic gain controlling amplifier for amplifying the signal portion passed by the filter and providing amplified output signal portion.

A switching signal generator responsive to one of the amplified output signal and the amplifier output signal portion for generating a switching signal is included, along with a switching circuit responsive to the switching signal for controlling the supply of a gain control signal to the first and second automatic gain controlling amplifiers in accordance therewith. An automatic gain control signal detector detects the amplified output signal for supplying an output indicative thereof to the switching circuit.

It is respectfully submitted, however, that Igarashi et al., alone or in combination with Suzuki et al., Gudmundson et al., or Frodigh et al., does not disclose or suggest a base station device including transmission means for carrying out communication of a down link to the communication terminal device by using a multicarrier signal having data dispersed to m units of subcarriers for transmission, receiving means for receiving the multicarrier signal having data dispersed to m



or  $j$  units of subcarriers transmitted from the communication terminal device and demodulating the data thereof, and discrimination means for discriminating the multi-carrier signal using  $m$  units of subcarriers and the multi-carrier signal using  $j$  units of subcarriers, so that demodulation processing conforming to a received signal is carried out by the receiving means on the basis of a result of discrimination of the discrimination means, as recited in amended independent claim 21.

Accordingly, for at least the above-stated reasons, it is respectfully submitted that amended independent claim 21, and the claims depending therefrom, are patentable over the cited references. Amended independent claim 27, and the claims depending therefrom, are believed to be patentable over the cited references for at least similar reasons.

Should the Examiner disagree, it is respectfully requested that the Examiner specify where in the cited document there is a basis for such disagreement.

The references cited as of interest have been reviewed and are not seen to show or suggest the present invention, as recited in the amended claims.

The Office is hereby authorized to charge any additional fees which may be required in connection with this Amendment and to credit any overpayment to Deposit Account No. 03-3125.

Favorable reconsideration is earnestly solicited.

Respectfully submitted,  
COOPER & DUNHAM, LLP

A handwritten signature in dark ink, appearing to read "Jay M. Maioli". The signature is fluid and cursive, with the first and last names being more prominent than the middle initial.

Jay M. Maioli  
Reg. No. 27,213

Attachments

JHM/AVF